DUST COLLECTION CONTAINER FOR A HAND-HELD POWER TOOL

Background Information

The present invention is directed to a dust-collection container for a hand-held power tool that has a dust-extraction device according to the definition of the species in Claim 1.

A known hand-held power tool designed as a finishing sander (DE 199 24 547 A1) has a dust-extraction device integrated in its housing, the dust-extraction device having a dust-discharge adapter formed on the housing. A dust-proof dust-collection container for collecting sanding dust – also referred to as a dust box – is detachably connected via its intake adapter to the dust-discharge adapter. The dust-collection container has a two-part design and includes a collection box and a cover that closes it from above, the cover being detachably connected to the collection box. To obtain the greatest possible volumetric capacity of the dust-collection container, a large number of air-exit openings is provided in the cover, the air-exit openings being covered by a dust filter located on the underside of the cover. To empty the dust-collection container, it is removed from the hand-held power tool, the intake adapter leading into the collection box being pulled off of the dust-discharge adapter. After the cover is opened, the collection box can be emptied.

When sanding work pieces, the dust-collection container becomes increasingly filled with the sanding dust produced. Its ability to take on more dust decreases continually and, as the suction decreases as a result, more and more sanding dust is released to the surroundings, which becomes increasingly more unpleasant for the operator. With belt sanders, the problem also arises that, due to the very large amount of material removed, the dust collection container fills up very quickly and, as a result, the operator usually does not notice that the dust collection container has become too full until the dust-ejection adapter and other dust-transporting ducts in the device have become clogged. The hand-held power tool must then be taken apart to be cleaned.

Advantages of the Invention

The dust-collection container according to the present invention for a hand-held power tool having the features of Claim 1 has the advantage that the operator can determine the fill level growing in the dust-collection container at any time by looking through the viewing window and, when a fill level is reached that still allows for optimum dust extraction, the operator can empty the dust-collection container.

Due to the measures listed in the further claims, advantageous further developments and improvements of the dust-collection container described in Claim 1 are made possible.

According to an advantageous embodiment of the present invention, the viewing window is located in a wall section of the container wall diametrically opposed to the wall section with the intake adapter. The viewing window is preferably located in the region of increased flow, so that the window is largely blown clean. It is advantageous that materials having a low tendency toward static discharge are used for the dust-collection container. A transparent cover, e.g., made of modified polypropylene, is preferably inserted as the viewing window in a corresponding window opening in the container wall.

According to an advantageous embodiment of the present invention, the container wall has two end faces, on one of which the dust-intake opening in located, and two longitudinal sides, in one of which the viewing window is located. The viewing window is preferably located close to the end face of the container wall in which the dust-intake opening is located. With this arrangement it is possible to detect the fill level of the dust-collection container at any time, when holding the hand-held power tool horizontally, i.e., when machining horizontal surfaces, and when the hand-held power tool is held vertically, i.e., when machining vertical surfaces.

According to a preferred embodiment of the present invention, filling marks are provided in the viewing window that indicate a recommended maximum fill level of the dust-collection container.

In a preferred embodiment of the present invention, two filling marks arranged at right angles to each other and designed as a line, for example, are provided, so that the quantity of dust collected in the dust-collection container can be determined during operation in comparison with the maximum permissible fill quantity when the hand-held power tool is held horizontally or vertically.

Drawing

The present invention is described in greater detail in the description below with reference to exemplary embodiments shown in the drawing.

Figure 1 Shows a hand-held power tool with a dust-collection container attached thereto and shown in a longitudinal cross section,

Figure 2 Shows a perspective depiction of a front view of the dust-collection container in the direction of arrow II in Figure 1,

Figure 3 Shows a side view of the dust-collection container in Figure 1 with a modified viewing window.

Detailed Description of the Exemplary Embodiments

Figure 1 shows a hand-held power tool 10 designed as a finishing sander with an attached dust-collection container 11, also referred to as a dust box. The hand-held power tool has a housing 12 that includes a handle 13 with switch 14 for turning hand-held power tool 10 on and off. A sanding tool 15 designed as a sanding disc with through openings is movably attached to the bottom of housing 12. Hand-held power tool 10 has an integrated dust-extraction device that includes a fan wheel 16 rotating in housing 12, a dust duct 17 leading away from fan wheel 16, and a dust-discharge adapter 18 into which dust duct 17 leads. During operation, fan wheel 16 rotating above sanding tool 15 produces a vacuum between sanding tool 15 and a work piece. As a result, sanding dust is suctioned through the through openings of the sanding tool and is discharged via dust duct 17 and dust-discharge adapter 18.

To capture the sanding dust, dust-collection container 11 is detachably connected to hand-held power tool 10. To this end, a dust-intake adapter 20 of dust-collection container 11 that encloses dust-intake opening 19 is slid onto dust-discharge adapter 18 on housing 12 of hand-held power tool 10.

Nondeformable dust-collection container 11 is shown in Figure 1 in a longitudinal sectional view, in Figure 2 in a perspective front view, and in Figure 3 in a somewhat modified form in a side view. Dust-collection container 11 has a container wall that encloses a dust-collection volume. The container wall includes dust-intake opening 19 in a wall section, the dust-intake opening 19 being enclosed by dust-discharge adapter 18, and a viewing window 21 at a distance therefrom, through which the quantity of dust filling the dust-collection volume at that moment can be visually determined.

With the exemplary embodiment of dust-collection container 11 according to Figures 1 and 2, the section of the container wall in which viewing window 21 is located is diametrically opposed to the wall section of dust-collection container 11 diametrically opposed to dust-intake opening 19. Viewing window 21 is located in the region of increased air flow in the interior of dust-collection container 11 so that viewing window 21 is blown clear. The container wall is made of a material that has a low tendency toward static discharge. The viewing window 21 can be realized, e.g., by inserting a transparent cover made of modified polypropylene into a corresponding window opening in the section of the container wall.

In the exemplary embodiment in Figure 3, viewing window 21 is located in one of two longitudinal sides of the container wall, viewing window 21 being located in the longitudinal side such that it is located as close as possible to the front side of the container wall that has dust-intake opening 19.

In both exemplary embodiments, dust-collection container 11 has a two-part design and has a collection box 22 that is closed by a cover 23 on its top side. Cover 23 is attached fixedly and tightly in a non-positive and form-fit manner via a snap-in edge 231 to the upper edge of collection box 22 such that it overlatches in a resilient manner, and has a hook 24 that extends upward. Dust-collection container 11 can also be attached to

housing 12 of hand-held power tool 10 by inserting hook 24 in a retaining opening 25 located in housing 12 and, in fact, in the rear region of handle 14 when dust-intake adapter 20 is slid onto dust-discharge adapter 18 on housing 12 of hand-held power tool 10 (Figure 1). Bottom 221 of collection box 22 is tilted relative to the axis of dust-intake adapter 20, so that collection box 22 has a contour with a wedge-shaped longitudinal cross section that tapers toward dust-intake adapter 20. Cover 23 has a large number of air-passage openings 26 (Figures 1 and 2), in front of which a filter element 27 made of special paper is located, on the inside of cover 23. In the exemplary embodiment in Figures 1 and 2, viewing window 21 is located in front wall 222 of collection box 22, front wall 222 being diametrically opposed to front wall 223 of collection box 22 that is diametrically opposed to dust-intake opening 19. The fold lamella of filter element 27 can be seen in viewing window 21 in Figure 2. A filling mark 28 designed as a transverse line and located in viewing window 21 indicates a recommended maximum fill quantity in collection box 22 that ensures that the integrated sanding dust suctioning device of hand-held power tool 10 can still adequately suction the sanding dust.

Dust-collection container 11 shown as a side view in Figure 3 is modified compared to dust-collection container 11 shown in Figure 1 and 2 only in terms of the arrangement of viewing window 21. Viewing window 21 is located in a side wall 224 of collection box 22 close to front wall 223 in which dust-intake opening 19 is located. Two filling marks 29, 30 located at a right angle to each other are provided in viewing window 21, one filling mark 29 of which indicates the recommended maximum quantity when dust-collection container 11 is oriented horizontally, and filling mark 30 indicating the recommended maximum fill quantity when dust-collection container 11 is oriented vertically. In the exemplary embodiment in Figure 3, both filling marks 29, 30 are designed as lines that extend parallel to a window edge at a close distance. Filling mark 29 extends close to long window edge 211 at the top when dust-collection container 11 is in the horizontal position, and filling mark 30 extends close to front, shorter window edge 212 close to dust-intake adapter 20.

In a further exemplary embodiment of dust-collection container 11, viewing window 21 is formed by an entire side wall of collection box 22 made of transparent material.

In an alternative embodiment of dust-collection container 11, entire collection box 22 is made of transparent material, so that the dust level can be determined visually from all sides.

In a further alternative embodiment of dust-collection container 11, the container wall and/or collection box 22 are made of a transparent material with a milky-opaque surface. Viewing window 21 is then formed by a recess in the milky-opaque surface.